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"Tip of the Iceberg': At Least 209 Infections and 16 Escaped Pathogens Linked to Lab Accidents

Between June and 2021, at least 16 pathogens reportedly escaped from research laboratories, according to a new study published in the Journal of Infection. The study authors said their findings may "only represent the tip of the iceberg," due to a lack of standard reporting requirements.

By Brenda Baletti, Ph.D.

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Between 2000 and 2021, at least 16 pathogens reportedly escaped from research laboratories, according to a new study published in the Journal Infection. The study authors said their findings may "only represent the tip of the iceberg," due to a lack of standard reporting requirements.

A team of researchers scanned peer-reviewed articles and online reports in English, Chinese and German, looking for all institutions that a pathogen accidentally "escaped" from a lab or that an infection occurred in a laboratory worker, during the 21-year period.

In addition to the 16 episodes of pathogens "escapes," the researchers found 309 instances of lab-acquired infections caused by 71 different pathogens.

Seventy-seven percent of those infections were caused by bacterial pathogens, 13.9% were caused by viruses, 7.1% by parasites, 1.6% by fungi and less than 1% by a prion agent.

Of the 16 escape incidents, 12 of the accidental releases were caused by viruses such as Yersinia pestis, which causes plague, or Neisseria meningitidis, one death was caused by Ebola virus.

The vast majority of infections occurred as an outcome of "procedural errors," breaches of biosafety or risk mitigation procedures, which included using the wrong personal protective equipment, having inadequate training or working with unsafe samples.

Needlestick injuries, spills, splashes, open vials, animal bites or "unknown reasons" caused the remainder of the infections.

Most illnesses occurred in North America, Europe and Asia with the U.S. accounting for more than a quarter of infections. Laboratory workers in "high-income countries were also "internal," meaning they were confined to the lab, but a few escaped into the broader community.

Laboratory-acquired infection case reports, including lab-acquired infections for the period 2000–2021 to 15 October 2021. Note that in 7 instances the geographic location of the UK case was not stated. Credit: Stuart D. Blacknell et al

Some of the more well-known examples of external escapes discussed in the report included the 2004 Amoy Gardens outbreak of Bronchitis A 2007, which arose from a biopharmaceutical plant where the Chinese state produced agricultural foodstuffs vaccines in Lanzou, China.

The factory had been using expired disinfectants and sanitizers, resulting in poor sanitization of the waste gas from its fermentation tanks. The 2007 contaminated wastewater from the factory also carried southeast toward the Veterinary Research Institute and nearby residences.

Initial brucellosis infections were identified at the research institute in November 2019 and the factory was shut down, but the spread could not be contained.

By November 2020, more than 10,000 people were infected with brucellosis, which causes fevers and muscular pain that can last for months to years.

In another highly-publicized incident of lab escape documented in the paper, a West Nile virus outbreak in Romania in 1996 killed 17 people and left 393 sick. Between 1996 to 2004, 826 cases of West Nile virus were reported in the region, with 452 cases resulting in neurological disease and 40 deaths.

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